

PLATE 7.

MEGASCOLIDES AUSTRALIS (McCoy).

THE GIANT EARTH-WORM.

[Genus MEGASCOLIDES (McCoy). (Sub-kingd. Articulata. Class Annelida. Order Abranchiata. Section Terricola. Fam. Lumbricidæ.)

Gen. Char.—Body very large, cylindrical, of from 300 to 500 rings, the anterior portion from a little behind the mouth thickest, suddenly narrowing at genital rings, then for some feet a little wider and again dilating slightly at the tail; the prominent middle third of each ring set with 8 very minute spinules arranged in four pairs on the abdominal and lateral two-thirds of each ring, leaving rather less than one-third of the dorsal surface smooth, and forming 8 longitudinal lines along the body from the genital rings. A row of spiracular pores along the mid-line of the back opening on the anterior edge of each of the rings except near the head in front of clitellæ. An imperfect genital, hard, cingulum or clitellæ extending only over the ventral third of about three rings towards anterior tenth of the length; rings near posterior end much narrower and less distinctly marked than at the anterior end.]

DESCRIPTION.—Body of about 350 to 500 rings (about 10 in 1 inch of anterior end when extended, or 14 in same space when contracted, about 16 in same space at middle of body), tapering to each end when extended, but both anterior and posterior ends becoming club-shaped when contracted; a marked narrowing of the body between the 36th and 40th rings behind the clitellæ; anterior end, of about the first 25 to 40 rings, sooty brownish-black, lighter on the ventral fourth of the surface, rest of body, back, belly, and sides alike in color and of a light, brownish flesh-color with a slight purplish-grey reflection; oral and anal apertures central. Between the 32nd, 33rd, and 34th rings from the mouth, on the ventral side, are three genital short bands, less than the rings in thickness and only extending round about one-fourth of the circumference of the body, forming an imperfect cingulum or clitellæ much tougher in consistence and lighter in color than the other parts. About 2 feet long when contracted and about 6 feet long when extended; 8 lines to $\frac{3}{4}$ of an inch in diameter. Spinets or setæ $\frac{1}{36}$ th of an inch long and $\frac{1}{500}$ th of an inch wide with the exterior pointed end very slightly hooked, general form slender, nearly straight, with a very slight sigmoid curve, subtruncate obliquely at base (more slender and less curved than Vaillant's figure of the setæ of *Perichæta cingulata*, Ann. des Sc. Nat. v. 10, pl. 10, f. 2, or Schmarda's figures of those of the four other species, and nearly agreeing with Baird's figure of *Megascolex (Perichæta) diffringens*, but rather more slender); each seta projecting from the end of each of 8 minute conical papillæ, the base arising from the prominent middle ridge of each ring, and the apices directed outwards and backwards; the 8 setæ, on successive rings, form 8 longitudinal lines, beginning from the 25th to the 32nd ring, to end of the body, arranged in four pairs, the outer pairs on each side about the length of a contracted ring apart, the ventral pair a little farther apart, and the pairs of rows about twice as far apart as the two rows of the pair; one-third of each ring forms a smooth space along the back of the animal, down the centre of which the breathing spiracles form a conspicuous line of transversely oval pores beginning about the 40th ring, and becoming indistinct before quite reaching the posterior end; the dorsal portion of the rings flatter than the rest and without the longitudinal muscular plicæ or wrinkles on the margins of the ventral and lateral thirds. The mouth is a transverse slit when closed $\frac{1}{4}$ of an inch wide; but when partially open the upper edge has a hard, thickened,

arched margin, closed below by a soft tubular sort of under lip, looking like a portion of the œsophagus everted; the head ring radiatingly granulated outside the opening. The first 30 rings are broader than the others, but each is divided into three by two impressed lines parallel to the margins, making it difficult to count them.

Dr. Templeton, of the Royal Artillery, was the first to draw attention to the existence of enormous earth-worms, 20 to 40 inches in length, and 1 or $1\frac{1}{2}$ inches in thickness, in the alpine region of Ceylon during the rainy season, in a letter sent to the Zoological Society of London, and published in their proceedings of 1845,* for which he proposed the name *Megascolex cœruleus*, from their size and color. They had 270 rings, and the genitalia occupied the 16th, 17th, and 18th rings, after which the diameter was less, and from the 15th ring a row of breathing pores extended along the middle of the back; and 100 setæ on each ring except on mid-line of back.

Schmarda next, in the second part of his admirable work "Neue Wirbellose Thiere," founded the genus *Perichæta* on the character "Setæ totam segmentorum circumferentiam in forma annuli cingentes," and remarks—"Das Geschlecht *Megascolex* wurde von Templeton aufgestellt. Es charakterisirt sich dadurch, dass die Borsten auf dem Rücken in Querreihen in der Mitte der Leibesringe stehen." Now Templeton, on the contrary, states distinctly that in his *Megascolex* there are no setæ on the mid-line of the back at all, but they form a row round the other parts of each ring. Dr. Baird next described † somewhat similar creatures of smaller size, from the earth imported with orchids into some hothouses in Wales (probably from India or South Africa), which he named *Megascolex (Perichæta) diffringens* from the great brittleness of the individuals, and supposing *Megascolex* and *Perichæta* to be synonymous genera. These living specimens were described to him by the gardeners to have different habits from earth-worms, twisting violently about like eels when held (the popular name eel-worm was given to them by Mr. Fish), and travelling by night with great swiftness over the surface of the ground, into which they vanish

* Annals and Magazine of Natural History, vol. xv., p. 59.

† Proc. Zool. Soc. Lond., 1869, p. 40.

with astonishing rapidity when disturbed. Neither Dr. Baird nor other subsequent writers can be justified in uniting the genera *Megascolex* and *Perichæta*, if Schmarda be correct in stating that in his genus the setæ go quite round the body, and in his *P. leucocycla* from Ceylon he even says—"Die Rückenborsten sind etwas stärker als die der Bauchseite." Schmarda is fully borne out in this by Dr. Grube in his description and figure of *Perichæta Tahitensis*, from Tahiti, in his essay on the "Anneliden" in the "Reise der Österreichischen Fregate Novara." Under any circumstances it is clear that our Australian species approaches more nearly to Templeton's genus, and cannot belong to *Perichæta*, which seems distinct from *Megascolex* by its smaller size, much fewer body rings, and fewer and much larger setigerous papillæ. Still, as Templeton says, his *Megascolex* has 100 setigerous papillæ on each ring, while ours has only eight, disposed in four pairs as in *Lumbricus*, I am constrained to use a special generic title *Megascolides* for the present form, and make it the type of a distinct genus, which only differs as far as I know now from *Lumbricus* in its great size, very much more numerous rings, and the clitellæ formed of three separate short bands, not going round the body, but being confined to the ventral side.

The setæ are extremely difficult to see and count, on most specimens, from their extreme minuteness; a slight brown speck showing under a lens on the lighter flesh-color skin the places of insertion of the setæ and position of the rows in which, after great trouble, I have satisfied myself the setæ are alone developed, is a great help in counting them. But, as I find on most of the rings several other exactly similar brown specks, 15 to 18 on the mid-ridge of each ring, those of one ring alternating irregularly with those of the adjoining rings between the true setigerous ones, forming the four pairs of longitudinal rows, but not really containing setæ, I have a strong impression that these may have been counted as setæ also by Templeton in his *Megascolex*, and it is not impossible that the longitudinal muscular plication (which also is absent on the back) may have been confounded with the slight papillary swellings from which the setæ arise. Furthermore, Dr. Baird, observing that all Schmarda's worms from the same locality as

Templeton's agreed with the introduced one he had examined, in having very numerous distinct papillæ, each with a seta, on each ring, concluded that the *Megascolex* and *Perichæta* were identical, but in the same localities in Victoria in which the present Giant Earth-worm occurs, I also find a true *Perichæta* (*P. Gippslandica*) (McCoy) in abundance, of the much smaller size, fewer rings, and with very numerous large papillæ and setæ going entirely round the rings (visible to the naked eye) of the described species of true *Perichæta*.

On the first entry of the surveyors into that paradise of land selectors, the Brandy Creek district, on the new Gippsland line of railway, I received from them numerous specimens of this gigantic Earth-worm, with queries as to whether it were a snake or a worm, &c. All of them, from the great diameter of the digestive tube, were almost like small membranous sausage-skins filled with earth, and from their great brittleness each individual was usually received divided into several pieces, the broken ends of which contracted so strongly as almost to close the wound, and decomposition setting in so rapidly that very little of the essential characters could be made out. Although I have more recently examined numerous perfect examples, both living and in spirit, I cannot find any male or female genital pores, such as are so conspicuous in *Perichæta*, the former between some rings on the ventral surface in front of the "cingulum," and the latter behind it.

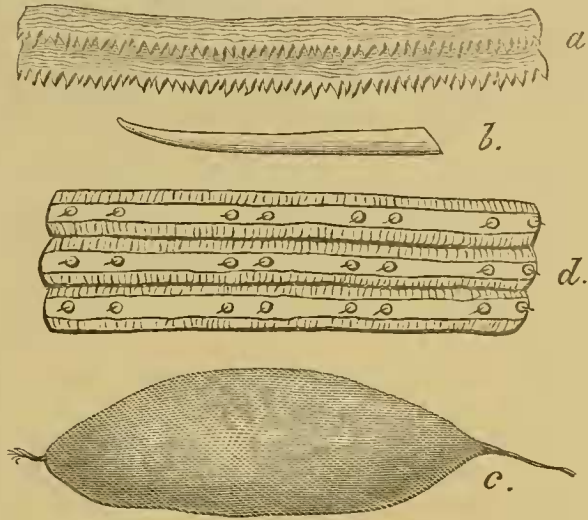
The living worms emit an odor resembling that of creosote. Like the ordinary earth-worms they burrow in the earth, swallowing the portion in front as they bore downwards, casting the portions from which they have abstracted the nutrient particles on the surface of the ground, renewing the surface by a kind of natural trenching which tends to bury the surface beneath a continual top-dressing of fresh soil from below.

I have recently received from Mr. Search several examples from Queensferry of the oval, tough, horny case or capsule, 2 to 3 inches in length, half an inch wide, and terminated by a bunch of filaments at one end, and a shorter pointed extension at the other, in which the young worm of this species is enclosed, nearly agreeing with that of the common earth-worm of Europe, except

in size. These capsules are greenish and translucent when fresh, but soon become dark-brown and hard in spirit.

A specimen of the thickness of that in the plate will stretch itself along the ground to a length of 6 feet in its exertions to escape, and one of that thickness held up measured 5 feet 10 inches. As has been observed of the *Perichæta*, the two ends remain alive and vigorous in movement long after some inches or feet of the middle may be dead and decomposed, differing in this respect from *Lumbricus*. The settlers

remark that fowls will not eat these worms, even when chopped up. When cut they bleed freely an abundance of the bright red blood which distinguishes the *Annelida* so curiously from the lower and higher classes of the invertebrate animals.



- a* Two rings of dried specimen magnified, showing the irregular conical spinose appearance of the muscular longitudinal bands on ventral and side portions.
b One of the spinules or setæ highly magnified.
d Three rings of body, magnified, showing the eight spinules on the middle ridge of each, the longitudinal muscular plication on the margins, and the disposition of the setæ to form on the successive rings, the four pairs of longitudinal rows.
c Capsule containing the young worm, natural size.

EXPLANATION OF FIGURES.

Plate 7.—Fig. 1, average specimen, natural size, the anterior rings extended, the line of pores being the breathing spiracles (these should not appear on the anterior dark-colored rings in front of the clitellæ). Fig. 1*a*, head of same specimen, contracted; close to the number and letter the three clitellar thickenings may be seen; natural size. Fig. 1*b*, anterior end view, showing the mouth, magnified to twice the natural size. Fig. 1*c*, anal termination, magnified twice the natural size. Fig. 1*d*, the three clitellar swellings when extended, natural size (the three slight depressions often seen in each are too strongly marked). Fig. 1*e*, same when contracted (the pit-like marks too distinct). Fig. 1*f*, dorsal view of smooth space along the back, with the median rows of transversely oval breathing pores on the anterior edge of the rings.

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